I. Waldbary

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““# THE SOUTHERN AGRICULTURIST.

(NEW SERIES.)

Vol. IV. FOR JULY, 1844. No. 7

For the Southern Agriculturist.

REMARKS ON RUFFIN'S REPORT OF HIS AGRICULTURAL SURVEY OF SOUTH-CAROLINA.

It is evident that Mr. Ruffin in his report, wished to invite and persuade the planters of our State, to study, practise, and adopt the improvements, by which others are growing rich, while they are going behind hand. He did not wish to hurt their feelings by publishing the defects in their mode of cultivating their lands; he did not say to one, your ploughs are badly shaped and proportioned, go up to Dr. Davis in Fairfield, or into Barnwell, or Clarendon, or St. Matthews, and a few other places, adopt their method and management, and you will succeed much better; nor did he say to another, your sons are fine young men, but you are bringing them up in idleness and ignorance of the improved system of husbandry as practised in other places; mount them on horseback and send them on an agricultural survey, in which they may themselves learn to handle a plough properly, practise what they learn, and thereby teach others, the way to gain and to save. He did not publish, that some of them did not plough at all; that few of the fields in our flat, low country were well drained; and that some of them had no ditch in them. These *slight defects* he suggested in private, where he had the opportunity, but urged in general terms, the necessity for amendment. He pointed out the various sources from which the greatest abundance of the finest manure may be obtained—the cheapest and easiest modes of applying it to the land, and the mode of rendering their benefit durable, and constantly increasing; instead of being washed away annually, requiring the same labor and expense continually, to be again exhausted.

He teaches us that vegetable matter is the basis of all manures —that it is indispensable as the food and nourishment of plants,

and that without it, neither stable manures, lime, marl or other stimulants, can do any good, although highly beneficial when united with it. He teaches us, that even where planters are industrious, and provident in collecting the proper quantity of manures for their fields, they are still deficient in the necessary proportion of lime or marl, to reduce that manure to the best condition for affording nourishment to their crops, and improving the body, substance, and firmness of the soil. That when the soil is so strengthened, it retains the rain, which otherwise would run off through the light sands, washing away the manure, which had been applied with much care to the crops. That where marsh-mud has been industriously spread over a field, it may fail, because the marsh-grass has not been collected with it, and the fields not changed by a rotation of crops. That by not changing the crops in rotation, bugs, caterpillars and other insects are generated in the soil, producing the rust and the various sources of failure, and of short crops, although not now suspected by planters. The vegetable matters alluded to, are, wood in the various forms of rotten trees, saw-dust, charcoal, straw, stubble, chaff, pine-trash, hay, cotton and corn-stalks; weeds, oak and other leaves, &c. All these should be, if possible, trodden upon by cattle and intermixed with their manure and water. Cotton-seeds containing much oil, are of a much richer nature than other vegetable manures, and approach to a mixture of animal and vegetable matter, but require the addition of pine-trash, &c. Marsh-mud, with the roots and marsh grass, mud from swamps, branches, ponds and other low grounds, which run into and around every field—providentially so distributed—containing the decaying and decayed leaves, &c. fallen into them, and washed down from the neighboring higher lands; are all placed within the reach of every planter, to pay him ten fold for his industry and attention in collecting them, whether intermixed with stable and pen manures, or spread directly over the fields. Marl, lime, green sand, wood-ashes, decaying shells, remains of lime-kilns and crushed shells, are all abundantly spread over the country, and some of them easily obtained on almost every plantation within 80 to 100 miles of the sea-shore.

Mr. Ruffin recommended that these should be mixed with the compost of stables and pens, but as hauling and rehauling all these, is tedious and troublesome, he thinks they may be advantageously

applied directly to the field, strewing the vegetable matters first, and then scattering the others broad-cast over the surface to moulder and intermix with the soil when worked. Millions of vegetable manures, that should be so spread over our fields—millions of wealth are annually consumed by fire, in the shameful practice of burning the woods every spring, and much other injury results from it. If only to protect his houses and fences, and save as much of pine and other leaves as may be wanted for manure, every planter should protect his settlement by seasonably drawing the inflammable matter from the roads, which with water courses pass more or less around every plantation.

In the culture of rice, no planter in South-Carolina, until the last two or three years, manured or rested his land, or changed the article cultivated, for any other article. Millions of stubble, straw, chaff and tailings, or light-rice, &c. are annually destroyed by fire, or otherwise lost to the strength of the soil, the produce of the crop, and the income of the planter. Many years ago, a premium was awarded by the Agricultural Society to Jordan Myrick, for having harvested from a field at the Villa in St. Johns Berkley, between eighty-seven and eighty-eight bushels of rough-rice. The field had rested several years, and had been occasionally flowed with brackish water; these were the only ostensible causes of so great a production, for it never afforded as much either before or since, even under the same workers and manager. This was the result of rest and manure, and although admitted by all, the hint was not taken, or the plan pursued. In 1839, Dr. Edward T. Heriot adopted the system, and having manured with straw, &c. planted rice land with peas, and made a fine crop. The next year he planted rice in this field, and procured about seventy-three bushels per acre from that which previously only averaged thirty-three bushels per acre. Col. R. F. W. Allston, Col. Josh. Ward, Mr. Poinsett and other distinguished planters in the neighborhood of Georgetown, are now adopting the system of rest, manuring and rotation in their rice-lands; and there is every reason to hope, that the crop will progressively improve in quantity and quality, until the average produce of a rice-field, shall have been increased from forty or fifty bushels, to ninety or a hundred. This must not be considered a visionary speculation. Neither marl nor lime has

been applied to this field by Dr. Heriot, and yet in one year the produce was fully doubled. Lime judiciously applied to crops of wheat, oats and corn, has certainly doubled the produce of the crops almost invariably, and there is more reason to expect it in rice-land, where such an abundance of roots, straw, &c. can always be supplied for it to act upon. Col. Pinckney Alston told Mr. Ruffin of two spots in rice-fields near Georgetown, on which the lime used for indigo vats fifty or sixty years ago, had been thrown where he had always seen a remarkable superiority in the growth of rice, and which continues undiminished. Dr. Dezell observed a very remarkable difference in the rice on one part of his field, and on examination, found that he had there casually ploughed up a quantity of marl, that he had not known any thing of, and which was no doubt the sole cause of the improvement. Mr. J. M. Dwight applied marl last spring to a small marked portion of new rice ground on Ashley river. Mr. Ruffin states, "in addition to hearing the remarkable benefit stated by several persons, I recently saw the remaining stubble of the crop; never was superiority of growth more manifest." Others have probably tried the effects of lime on rice-land, the results of which we have not heard.

Mr. Ruffin's "Observations on the action of calcarious manures and their practical application and effects," commencing at p. 48, are full of interest to every portion of the State, and especially so to those living in the lower division of it.

The Farm House, a late work from France, translated and republished in New-York—states that the best lands in France contain about 3 per cent. of lime, and Dr. Shepard discovered 2 per cent. of lime in the best land for sea-island cotton, known in our State. The coincidence is remarkable, and tends to show that the fertility of such lands, is probably dependant on the lime contained in it; that it is still one third weaker than the best wheat lands of Normandy, &c. and may be much improved by an additional supply of lime. The author of the Farm House, in stating the very great advantages of marl in agriculture, regrets that English farmers do not agree in the invariable benefits resulting from the judicious application of it to their fields, and explains it in two ways. In the first place, many of the dissenters apply too

much marl to their land, in proportion to its strength, and therefore fail, doing more harm than good. The remainder calling any indurated earth marl, ignorantly use mixtures of clay and sand, in which there is not a particle of calcarious matter, and therefore not marl. Much valuable information may be obtained from this excellent periodical publication; much practical knowledge may be acquired on the nature, composition and action of the various manures, vegetable, mineral and animal, with their compounds; and their relative uses, quantities and modes of application. The proper mixtures or proportions of earths for improving the various qualities of the soils, and the successive crops in rotation, and the products of each manuring.

To these is added minute instruction for draining and drying the fields; for dyking, embanking and reclaiming lands; for breaking up old and new soils; for the ploughs, harrows, cultivators and other implements to be used, and the mode of using them; together with the cost of labor, economy of workmanship, &c. &c.

One of the most valuable results from general marling, is the enjoyment of health—not only by our planters, their families and workers, but in that of their working cattle, their mules and horses. Mr. Ruffin declares that this is unquestionable in Virginia, or rather in those parts of it where they are marling most freely. He says that previous to the use of marl, almost every plantation in those counties was for sale, and the almost constant absenteeism of the inhabitants, exhausting all their resources. That it is widely different at present; that no plantations are now sold from choice, or for the purpose of removing to the West and South-West. The owners stay at home and improve their lands by judicious marling; bring up their children in health and local attachments, and when of age, settle them in the neighborhood to go on improving and marling for the benefit of their own families that are to follow. Mr. Ruffin has been for several years endeavoring to purchase land, and cannot meet with an offer. He says that the very texture and appearance of the light sandy soil is changed by marling, and becomes in color, firmness and appearance, as well as productiveness, similar to our best oak and hickory land. Who that can make so valuable a change in his exhausted old fields, by marling and manuring them three or four years in succession, would think of going Westward to suffer all the privations and hardships of a

life in a wilderness, and to bring up his children in ignorance, and the lawles vindictive habits of the western inhabitants. Who that can at least double the produce of his plantation, by such simple means, and thereby enhance the real value of his landed estate, would think of sacrificing all his local and personal affections here, and of removing among a set of strangers, very different in morals, literature and religion, from every thing that he cherished here as most estimable in social and domestic life.

We continue our extracts from Ruffin's Agricultural Survey:—

Observations on the action of Calcareous Manures and their practical application and effects.—Every proprietor knows, that the profit of cultivation is much greater on rich than on poor ground. But very few have estimated *how much* greater is the profit; and nowhere, within the sphere of my observation, are the prices of lands properly graduated, in proportion to their fertility and true productive value. If properly estimated, it would be manifest that poor land, for cultivation, if to remain poor, would be dear as a gift, and its cultivation the most costly of all. Yet, the greater number of cultivators of such soils, are content to remain in that condition, without making an effort, and scarcely indulging a hope of improving their fields and their profits.

It is not the less remarkable, that the more sanguine and enterprising cultivators, who aim and hope to improve, seldom inquire into the causes and manner of the operation designed, and therefore, most naturally, seldom succeed in their design. To apply the ordinary putrescent manure, is generally the sole means attempted or thought of; and if on poor and bad soils, in the race between exhaustion and new fertilization, the latter is invariably left far behind.

It is a universally acknowledged truth, that what is needed to make soil most productive, are such ingredients as will supply, in sufficient abundance, the *food of plants*. Growing plants draw from the soil by their roots, and are nourished by the dissolved parts of nearly all putrescent matters, either vegetable or animal, or mixtures of both. The ordinary manures are precisely such substances; and sooner or later, by their gradual decomposition, are converted almost entirely to the food of plants, and if judiciously applied, are consumed by, and help to sustain the growing crops.

But it is not enough, by a great deal, that manures serving to form food for plants, shall be given to the soil. There are other conditions necessary for their profitable and best effects; and the most important of these conditions is, that the soil shall be so constituted as to preserve the putrescent matters from waste and profitless dissipation, and to give them wholly for the support and growth of plants. This condition is furnished by nature, in well constituted soils only, which present the most productive and dura-

ble lands under tillage. Without this constitution, all the supplies of putrescent manures which can be given to a farm, will be of little profit; and if derived from its own resources only, will be utterly insufficient to preserve, and still less to increase, the yearly measure of productiveness of the land.

To learn the causes of the difference of soils in their power of receiving fertilization, it is necessary, and it will be sufficient, to go back to first principles, and trace soils from their formation, and their most simple conditions.

All soils, for their essential parts, are composed of the three important earths, silica, alumnia and lime, (the latter combined, usually and at first with carbonic acid, forming carbonate of lime) and with an addition to such compound soil of putrescent matter, of either animal or vegetable origin. Each of all these ingredients, in some proportion, is indispensable to every soil—or it would be barren if either were entirely wanting, no matter how abundant might be all of the others. The absolute necessity for the presence of each substance, will be seen by the consideration of their qualities and powers.

Silica, or silex, in its pure state, forms rock crystal. Ordinary sand furnishes it nearly pure, and enough so to show its utter unfitness to retain putrescent manures , or, even while such manures are passing away, for such a mixture to make a soil capable of sustaining plants. The hardness of the grains of sand, forbid their absorption of all moisture, and their loose and open state, permits all fluids to pass through and to escape rapidly, either by sinking, when abundant, or by evaporation, when scarce. The latter mode of waste is much increased by the great heat of such sands, received from the sun. Thus, with the changes of the weather, sands would be in rapid and violent alterations, drenched thoroughly and washed by rains, and dried by the sun and wind; any putrescent matter present, would, by these changes, be rapidly carried through all the stages of fermentation and decomposition, and go to waste, because there would be no property whatever in the sand, to combine with or to retain the results of fermentation. A pure sand would, necessarily, soon loose every particle of putrescent matter; and the nearer any soil approaches to a pure sand, the more nearly would it approach such a result.

Alumina, or argil, is the pure matter of clay, or that which, when united with more or less of silicious sand, forms clay, and gives to the mixture its adhesiveness, plastic quality, and close texture. It is clay we have to consider; for perfectly pure argil or alumina is never known, either as soil or subsoil. A clay containing much alumina, is difficult to become either wet or dry from the opposite condition. When very wet, it is a sticky mortar, and when quite dry, is almost as hard as stone. It forms the most intractable soil under tillage, and the most forbidding to the growth of plants. Putrescent manures, or their soluble results, cannot

penetrate a close clay—or if artificially enclosed, are kept therein imprisoned and inert, and comparatively useless to the crop. There is but little chemical attraction or combining power, between clay and putrescent matters, even in the chemist's operations, designed most to favor their combination; and as nature and cultivation can only operate much less perfectly to this end, there are scarcely any means for the little combining power of clay to act at all. Thus, as of sands, though in a different mode, pure or stiff clays have no power to receive manures, or to retain and yield them for the proper consumption of growing plants.

Thus, if pure silicious sand, or pure and very stiff clay, alone formed the earthy parts of a soil, no supply of putrescent manure could be either durable or effective in any important degree, and certainly not profitable for the application.

If the sand and clay were mixed in due proportions, then the soil would be greatly mended in texture and in relation to moisture. But still there would be no chemical attraction for, or power of combining with and retaining putrescent manures. And therefore, such a mixed or medium soil, though exhibiting less of the opposite defects of almost pure sand or pure clay, would be nearly as barren, and quite as incapable of being durably enriched, as either. And when soils are constituted of any of the grades of the three classes above referred to, or even with any slight and insufficient admixtures of other and necessary ingredients, it is not at all strange that they should be incurably sterile. It would, indeed be strange and unaccountable, were it otherwise. Still, the far greater number of natural soils in the Southern Atlantic States, approach nearly to one or the other of these three classes; and though having enough of other ingredients to prevent absolute barrenness, have not enough to permit them to be much or profitably enriched by putrescent manures—and not at all beyond their natural degree of productiveness, however low that degree may have been.

It is the presence of the third ingredient first named, lime, which serves to remedy the defects of all the others, and to make useful the peculiar qualities (all of which are essential to soil) of the silicious sand, the argil, and the putrescent and alimentary matters of the soil. And though the natural quantity of lime is generally very small, and much too small, in this region especially, there is some little in every soil that is capable of maturing a plant of any kind. Small as may be the quantity, it is essential to the formation and perfection of every plant; and if there were not a particle of lime in any soil, it would not be capable of maturing a seed, or of supporting even a blade of grass. And as but a very small proportion will serve to give its best operation to soil, there is sufficient inducement and means almost every where, for man to supply to the soil what nature has withheld, in sufficient quantity.

In the form of combination in which nature generally offers lime, that is, the carbonate, and probably in every other form of

combination subsequently taken in soil, it has a strong chemical attraction for soluble putrescent matters, vegetable and animal, and a power of combining with them, forming compounds which cannot be decomposed by air, water, or heat, and which therefore, cannot go to waste, but which are perfectly decomposable by the powers of growing vegetation, and therefore may be profitably and entirely used as food for plants. Herein is the great secret of the benefit of calcareous manures. The combining with and fixing in soils putrescent matters, is then a great and most beneficial operation, and of which all other earths, (unless magnesia be, as I presume it is, an exception,) are entirely destitute.

We need go no further to show that calcareous earth in soil is all important. Still it has several other very valuable operations in increasing the productiveness of the soil, which would require too much time to be more than barely touched upon here. Some of these other modes of operation are as follows:

1. In neutralizing the acid principle of soil, which is generally present in all naturally poor soils, and which is poisonous to all cultivated and valuable crops. The total removal of this poisonous quality of soils is an immediate and the most obvious effect of the application of calcareous manures.

2. In the power of altering the texture and absorbency of soils. The admixture of calcareous manures with soil, serves in an important degree to moderate the previous opposite defects of being either too open and light, from excess of sand, or of being too close and tenacious, from excess of clay; and also of being either too little or too much retentive of moisture.

3. By the alteration of constitution in soils, produced by calcareous manures, all products are rendered more perfect, and are ripened earlier. The latter effect is especially important to the late cotton in S. Carolina, over and above all increase of fertility, and of general bulk of product.

4. Some lime being essential to the formation of every plant, it may therefore be considered a specific and alimentary manure for every crop. Still this *direct* operation is perhaps the least of the benefits of lime. Some plants, however, of which clover is one, require so much of this ingredient, that they can scarcely live on ordinary soils.

5. Another operation of calcareous manures, and which is very important also in agricultural and pecuniary value, as well as for other considerations, is that of restraining or preventing the production of malaria, or the gaseous products of putrefaction of vegetable matter, injurious to health. No effect yet claimed for the operation of calcareous manures was at first heard with more incredulity than this; yet the short experience of 12 or 15 years only has been enough to remove almost every doubt on this subject in lower Virginia, where marl has been most extensively applied.

6. Finally, by furnishing to any soils which had been previously very deficient therein, an ingredient in calcareous earth, essential to their good and perfect constitution, all the functions of the soils and of plants growing thereon, are made more perfect, and invigorated; and every source of injury to the crops, whether from soil, season, depredations of insects, or other diseases to which may be alike exposed the marled and unmarled parts of the same field, will be much less hurtful (if even perceptible in effect,) on the former than on the latter. The calcareous manuring does not prevent or even lessen these causes of diseases and death, but enables the plants, by their greater vigor, to withstand and to out-grow the inflictions, and thus renders them comparatively harmless.*

If the preceding views be sound, the manifest deduction from them is, that *all lands which are not already calcareous*, or sufficiently supplied with lime by nature, *require to be made so*. And relying upon my former and very general observations and examinations of soils elsewhere, as well as a fewer but sufficient number recently made in S. Carolina, I may venture to assert that there are scarcely any natural soils, if indeed a single one, in all that extensive region, which has *carbonate of lime* as an ingredient, or constituent part. And though all soils (as before stated) must contain lime in some form of combination, as I infer with vegetable acids, still in nearly all the upland soils of this great region, and especially those on which pine forms the principal and most vigorous growth, the proportion of such vegetable salts of lime is much too small, and the addition of more lime or carbonate of lime is greatly needed, and would be highly beneficial and justifiable, where the maternal may be had cheaply enough. There are, indeed, some other soils which received more lime originally from natural supply, and which still show, and will always show, the superior fertility and durability thereby conferred on them.—Among such soils are those of Dawshee and Eutaw on the Santee, and many other smaller bodies of similar valuable upland, elsewhere; and such are the numerous rich alluvial soils deposited by river floods, or of swamps over-lying marl, or otherwise naturally limed originally. But even these lands, the best provided by nature with the essential ingredient, lime, have not enough of it in any form of combination, and not a particle in the form of *carbonate* of lime—which form is presented by marl, and by quick lime after a short time also, and in which form it would be found in natural soils, if calcareous, and abundantly furnished with lime. Though so few have been the practical applications of calcareous manures and designed experiments in this state, the results of many accidental and chance-made experiments have been observed, which go fully to prove the great and durable improvement made by lime on the richest alluvial rice lands.

* See all these positions argued and established in Chap. 8, and elsewhere in Essay on Calcareous Manures.

Deeming then, that calcareous manures will benefit nearly if not all known soils in S. Carolina, and increase their production of all crops, the next questions are, how far the means are available, at not too great cost, and what measure of increased production of crops may be counted on from the application of calcareous manures. These questions being inseparable, will be answered together, generally and concisely, and without giving reasons or proofs which would occupy too much space here, and for which, as before stated, I refer to preceding publications.*

The benefit, or increased product of crops, to be expected from *proper* applications of marl, if estimated by the numerous known and unquestioned facts of results in Virginia, may be expected to range (according as circumstances may be more or less favorable to the action,) from 20 to 50 per cent. increase on the first crop; and to increase thereafter in each successive crop, until a permanent maximum product is reached of 100 to 300 per cent. upon the product previous to the marling. And the increased products would be much larger at first, and also in after time, (as is the case in Virginia,) but for the general plan of continual and exhausting tillage in S. Carolina. The improvement is permanent, so made. Whatever is thus gained, will never be lost under a proper course of culture, and that not required to be more mild than due considerations of profit ought to dictate under any circumstances. And though additional dressings of marl or lime will be needed in after time, it will not be because any of the early effect of the prior application has been lost, or is even diminished, but because another and new increase of production may be then added to the first.

(To be Continued.)

For the Southern Agriculturist.

AN ADDRESS,

Delivered before the St. Andrews' Ashley and Stono River Agricultural Association, on their Anniversary, 1844, *by their President,* J. S. Brisbane, Esq.

Gentlemen,—We have met to celebrate the anniversary of our Association, and it gives me pleasure to congratulate you on the recent progress we have made in our agricultural economy. On every plantation we see the mounds of compost accumulated from

* In addition to the numerous statements, both of general operation and particular results of marl and lime, given in the essay on calcareous manures, and also in various parts of the Farmer's Register, a number of special answers to particular and comprehensive queries on this subject, may be advantageously referred to in vols. 8 and 9 of the last named publication. A concise digest of these answers, on the most important points, arranged in tabular form for easy reference, will be added to this section of the report.

all the sources which can contribute to the improvement of our lands. Rushes from our marshes, muck from our ponds, leaves from our woods, are mixed with the proceeds of stables and cattle-pens, to supply the drafts made on our fields, to sustain the different crops planted on them. And I am pleased to find, it is not confined to planting alone. We now hear as familiar topics, of our Durham cattle, our Berkshire hogs, and Bakewell sheep, evincing a disposition to improve our stocks as well as lands. This is as it should be, and we shall soon feel the advantages in our comforts, as well as pockets.

I will make some observations, which must be of a general nature, as our incipiency does not furnish data sufficient for comment, but should I judge from the voluminous reports on our Secretary's table, which we have not yet heard, it will not long be the case.

When a number of persons are delivered from famine, occasioned by shipwreck or any other cause, their deliverers are apt to supply them too abundantly with whatever will renovate their exhausted frames, without discrimination. The robust man will digest any thing, and have his strength renewed, but the delicate lady requires a different preparation of food to establish her health. We are the deliverers of our famished lands, and supply them with all that we can procure, without reflecting that the hardy roots of corn will permeate a mass of undecomposed matter, and flourish on its humus, when the tender spongelets of the cotton plant will shrink from the contact. Our soils too require different treatment. The clay soil is most benefited from our stables, and the sandy soil from our cattle-pens, and both from our marl pits. Marl being of a medium quality renders the clay more friable and the sand more tenacious. This is but one of the advantages arising from its use. In mentioning marl, we cannot refrain from associating the names of Governor Hammond and Mr. Ruffin. The former has memorized his name by the introduction of the use of marl, and his gubernatorial term by his appointment of the latter to the office of Agricultural Surveyor. Men may cavil at motives of actions, I deal with results. A good act is done by different agents, actuated by different motives: the vain man to please the world, the proud man to please himself, the religious man to please his God, the Christian to gain a seat in heaven, and the Mahomedan

to enjoy beauty. I leave the degree of merit in the different motives of the different agents, to be determined by a more competent power—being satisfied with the beneficence of the act itself. Governor Hammond has benefited the State by its introduction, and the publication of the process and results; and considerably more by the appointment. Whether Mr. Ruffin acted in conformity to his duty merely, being paid for his services, or from a higher motive (which I believe,) of doing all the good he could to the community, I am assured, we are obliged to him for a great deal. His report which is familiar to you all, speaks for itself; his treatise on marl says more, and his conversations above all;—for they not only contained much information, and that imparted in the most agreeable manner, but they excited to action the powers of our own minds hitherto dormant upon that subject, and have given rise to so many experiments which would not have existed but through his persuasion, at least for some years, the results of which I am assured, will be beneficial. I, therefore, hope his visit to us will be recollected as an era in agriculture.

The question has been often mooted, and recently here, whether *a literary man is likely to be the best planter?* I shall not presume to determine this question, but will make some observations on it. Literature will enable one to take a comprehensive view of agriculture; to compare the systems of different countries, and choose what is best for his own purposes; to trace effects to causes; to analize his lands, perceive their defects, and apply the remedies. On the other hand, will not the diffusion of knowledge, abstract his attention from his agricultural pursuits? Will he not be likely to take more pleasure in comparing Byron's poetry with Scott's, or Brougham's vigor with McCauley's elegance, than the best number of rows, which the quality of his land, in either rice or cotton, will bring to perfection? We know, that success in agriculture, depends on minute attention to objects, separately trifling, but aggregately of the greatest importance, indeed, absolutely essential to success. The man of literature who is habituated to generalize his thoughts, cannot devote his attention to minutiæ, even though he may be conscious of their importance. Further, it is in vain to possess a knowledge of planting, without possessing a knowledge of the proper management of slaves. They are our impelling

power, and if not properly directed, will lead to failure. Now, the very means of acquiring literature, if not the acquisition itself, incapacitates us from being able to compete with men in the knowledge of trickery. Nothing but an early knowledge of their powers of evasion, will allow us to detect their duplicity, and prevent our becoming dupes to their superior cunning or sagacity in roguery, if you please, in our relative situations. It is their business to deceive us, and ours to detect the deceit. Now, the man of literary knowledge, who has spent his youth in acquiring it, enters the field to a disadvantage, and must be imposed upon. Perhaps the strongest argument is, that the acquisition makes his taste fastidious, and he compounds to be imposed upon, so that he may read one of Bulwer's novels, lounging in one of Holmes' Therapeutic chairs.

This is the age of charlatanry, as well as of invention. If Bommer's manure be not among the former, it is calculated to be of much service. Our low lands furnish cane-grass, our high broom-fennel, briars, &c., and our woods leaves, pine-trash, &c.; and what is most advantageous, with little trouble in conveyance.—Arthur Young recommended something similar, which was a hole to be dug, and alternate layers of vegetable matter and lime to be placed in it. It required a longer time to be fit for use. This may be better as to strength, and to the time required for preparation and maturity. It is now a mooted question, whether vegetables derive their nourishment from the earth or air.* Some contend, that if it be from the air, it is through the ground they receive it; and we shall soon be as familiar with aration as we are now with irrigation. Others take a middle ground and say, they receive from the air all inorganic matter which is required for their growth.

I hope you will continue to apply, as much manure as you can possibly make, to your crops; for all agree, that whether it acts directly as food, or by its power of attraction of the ammonia of the atmosphere, it is essential to a good one.

I am pleased to see the prospect of an increase of our Association, not only numerically, but by weight of character. It is a subject for congratulation, with which I conclude.

AN ANALYSIS OF RICE, RICE-STRAW, CHAFF, &c.

At a meeting of the Agricultural Society of Winyaw and All-Saints, in Georgetown District, in November, 1843, it was proposed, that an Analysis be made of the Grain, Straw, Chaff, &c. of Rice. This was agreed to, and the task committed to Professor C. U. Shepard, of the Medical College of the State of South-Carolina. The following analysis is the result of his chemical investigations, and was handed to Col. Allston, the Chairman of the Committee appointed, to carry the proposition into effect.

Charleston, S. C., April 6th, 1844.

Dear Sir,

I hasten to lay before you at the earliest moment in my power, the Report on Rice, concerning which I have had communications with yourself and Dr. Parker. I hope it may not disappoint the expectation already formed of the work by yourself, or the Society for which it has been executed.

The task has greatly exceeded in difficulty, the estimate I formed respecting it at the outset; it having occupied me most closely in my Laboratory for at least three weeks. The results given in the report are generally deduced from the averages of repeated analyses.

If the Society publishes my report, I should feel obliged if a copy would be forwarded to the Hon. Mr. Ellsworth, of the Patent Office, Washington, whom I have led to expect such a favor.

And I have the honor to remain,

Most respectfully, your obedient servant,

CHAS. UPHAM SHEPARD.

Hon. R. F. W. Allston.

CHEMICAL EXAMINATIONS OF THE RICE PLANT AND RICE SOIL IN SOUTH-CAROLINA.

I.—*Of Clean Commercial Rice*

Burned in a porcelain capsule under the muffle, until all combustible matter had disappeared, a blebby glass-like ash remained weighing 0.404 per cent., or less than half a part in one hundred of the rice consumed.* Corrected statement of mineral constituents of clean rice=0.487 per cent.

Composition of 100 *parts of this residuum.*

Phosphate of lime (bone-earth,) with decided traces of intermixed phosphate of magnesia,	76.20

* It being requisite to determine the inorganic ingredients of rice, and of the various parts of the entire plant, as it may reasonably be supposed, they are returned to the soil again on the decomposition of the plant and its parts, (whether taking place spontaneously or otherwise,) and not to give those ingredients in all cases as they are actually yielded to us in the process of destructive analysis, I shall subjoin many of the constituents of the ashy residua not as found, but rather as the principles of chemistry authorise us to deduce them, in accordance with the above requisition.

Phosphate of potassa, nearly 5 per cent., Silica, sometimes as high as 20 per cent., And the following salts in traces only. They are enumerated in the supposed order of their abundance, viz: Sulphate of potassa, Chloride of potassium, Carbonate of lime, Carbonate of magnesia,	24.8

2.—*Of the Cotyledon, commonly called the eye or chit of the grain.*

Ignited under a muffle on a porcelain plate, it burns with a bright light, and the ash flows into a glass. From the intimate way in which it adhered to the plate, it was impossible to determine its weight or even its composition in a satisfactory manner. The expression 6.824 per cent., however, may be taken as an approximation to the weight of the residuum. In composition, it appears scarcely to differ from the ash of clean rice, except in being somewhat richer in lime, and in the phosphoric and sulphuric acids.

3.—*Of the fine Rice Flour, as it comes down on the bulk.*

It gives on burning, a bulky, porous ash, weighing 10.746 per cent., of the flour consumed. Corrected as above=12.30 per ct.

Composition of 100 *parts of this residuum, as follows:*

Silica, with traces of combined potassa, - -	38.02
Phosphate of lime, with traces of phosphate of magnesia,	54.60
Phosphate of potassa, (rich in this salt,) Sulphate of potassa, Sulphate of lime, in traces, Chloride of calcium, " Chloride of potassium, " Lime and magnesia, " — and loss,	7.38
	100 00

4.—*Of coarse Rice Flour, from the bulk.*

It gives on burning, a bulky, porous ash=11.23 per cent. Corrected statement=11.831 per cent.

Composition of 100 *parts of this residuum, as follows:*

Silica, with traces of combined potassa, - -	69.27
Phosphate of lime, with traces of phosphate of magnesia,	28.94
Phosphate of potassa, (rich in this salt,) Carbonate of potass, in traces, Sulphate of potassa " Lime and magnesia, " Chloride of calcium, " Chloride of potassium, " — and loss,	6.79
	100.00

5.—Of the Husk, commonly called chaff, or offal.

Burns with little or no flame, into a perfectly white, silicious skeleton of the husk. In weight, it equals 13.67 per cent.

Composition of 100 parts of this residuum, as follows:

Silica, - - - - - - -	97.551
Phosphate of lime, with traces of alumina and oxides of iron, and manganese,	1.023
Carbonate of lime, - - - - - -	0.294
Phosphate of potassa, Sulphate of potassa, in traces, Chloride of potassium, " Carbonate of potassa, " and loss,	1.132
	100.000

6.—Of the Rice Straw.

Burns into an ash which is a semi-fused, glassy frit. It weighs 12.422 per cent.

Composition in 100 parts, as follows:

Silica, - - - - - - -	84.75
Potassa, with probable traces of soda, combined with the above silica,	8.69
Phosphate of lime, with traces of oxide of iron (and manganese?)	2.00
Carbonate of lime, - - - - - -	2.00
Alumina, in traces, Phosphate of potassa, Carbonate of potassa, Sulphate of potassa, Chloride of potassium, and loss,	2.56
	100.00

7.—Rice Soil from Waverly Island.

Silica, with fine sand, one-third of which is feldspathec and slightly magnesian or talcose; and contains alumina with from 2 to 4 per cent. of potassa, mingled with soda and magnesia,	47.75
Alumina, partly combined with humic acid, -	12.35
Peroxide of iron (combined with humus,) with decided traces of phosphate of lime, (bone-earth,)	4.15
Carbonate of lime, with traces of magnesia, - -	0.40
Water of absorption, 8.50; Humus, (organic matter,) 23.50 - - -	32.00
Chloride of calcium, Sulphate of lime, Sulphate of magnesia, Sulphate of potassa, Chloride of sodium, and loss, - - -	1.35
	100.00

8.—*Rice Soil from Woodville, Main, Waverly.*

Silica, with fine sand, as above,	- - - - -	57.50
Alumina, partly combined with humic acid,	- -	10.45
Peroxide of iron (combined with humus,) with decided traces of phosphate of lime,		4.60
Carbonate of lime,	- - - - - -	0.40
Carbonate of magnesia,	- - - - - -	0.58
Water of absorption, 7.50; Humus, 17.80	- - -	25.30
Chloride of calcium, Sulphate of lime, Sulphate of magnesia, Sulphate of potassa, Chloride of sodium,	and loss, - -	1.17
		100.00

9.—*Rice Soil from Matanzas on the Main.*

Silica, with fine sand, as above,	- - -	60.50
Alumina, partly combined with humic acid,	- -	8.15
Peroxide of iron (combined with humus,) with decided traces of phosphate of lime,		3.00
Carbonate of lime, with traces of magnesia,	- -	0.85
Water of absorption, 9.00; Humus, - - 18.50	- - -	27.50
Chlorides of calcium and of sodium, Sulphates nearly as above,	and loss, -	1.00
		101.00

10.—*Rice Soil from Dr. Parker.*

Silica, with fine sand, as above,	- - -	41.25
Alumina, (combined with humus,)	- - -	9.25
Peroxide of iron, (combined with humus,)	- -	3.30
Phosphate of lime,	- - - - -	0.55
Carbonate of lime,	- - - - -	0.85
Carbonate of magnesia,	- - - -	0.45
Water of absorption, 9.50; Humus, (with odor of ammonia,) 33.50	-	43.00
Chloride of calcium, abundant, Chloride of sodium, Sulphate of lime, Sulphate of magnesia, Sulphate of potassa,	and loss, -	1.35
		100.00

Additional particulars, with some consequences from the foregoing.

[1.] 100 parts by weight of rough rice, (from which the remains of stems and glume-leaflets had been separated,) gave

82.10	parts of	grain, and
17.90	"	husk.
100.00		

[2.] 100 parts of unhusked grain, gave

95.238	parts of	non-cotyledonous grain, and
4.762	"	cotyledons, or eyes.
100.000		

[3.] 100 parts of non-cotyledonous unhusked grain, gave

94.3	of grain without husk, cotyledon or epidermis,
5.7	of epidermis, or inner coat.
100.00	

[4.] 100 parts of rough rice, then has

17.900	husk.
3.909	cotyledon.
4.456	epidermis.
73.735	clean grain.*
100.000	

[5.] The ratio of rough-rice to the straw of the harvested grain, deduced from taking the mean of 15 separate experiments, gave the weight of the grain 53.5, that of the straw, including the panicle or stems, 23.6.

But as many of the leaves appear to have been mutilated, I am disposed to assume as a probable approximation to the truth, the weight of the grain as just double that of the cut-straw. And as some observation of the stubble and roots strongly favors the idea of their equalling together the weight of the straw, I shall still farther venture to consider the rough-rice of a ripe, harvested plant as equal in weight, that of the entire stem, leaves and root.

[6.] Let us next attempt an approximation towards an appreciation of the mineral constituents of these different portions of the rice plant.

The ash in 100 parts of rough-rice equals 4.762 parts. And as the ash in 100 of the husk, equals 13.67, that in 17.90 parts of husk must equal 2.446 parts. By difference, therefore, between 2.446 and 4.762, the ash of the cotyledon, epidermis and clean grain, in 100 parts of rough-rice, will equal 2.316 parts.

* From losses sustained to the clean grain, in the process of milling, it is not probable that above 70 parts of commercial rice are afforded by 100 of rough-rice.

But the percentage of the ash in clean rice being known, we are able to state what the amount of ash is. In clean rice of 100 parts rough-rice, it is 0.297 parts. The general statement, then, will stand thus, for 100 parts rough-rice.

Ash in the husk,	2.446	parts.
" cotyledon and epidermis,	2.019	"
" clean grain,	0.297	"
	4.762	

[7.] The straw (including the stubble and root,) having been assumed as equal in weight to the rough grain, the ratio of the mineral ingredients of the former to the latter, stands as 12.422 to 4.762.

[8.] Considering a single rice-plant, in its dry, mature state, to weigh 100 grains, (a supposition which will often accord with the fact,) we shall have of mineral matter in the different parts of the plants, the following number of grains:

In the stubble and root,	36.08
" straw and pan leaves,	36.08
" husk,	14.20
" cotyledon and epidermis,	11.70
" clean rice,	1.94
	100.00

As however in the milling, nearly one-sixth of the cotyledon still adheres to the grain, for all practical estimates; it will be nearer the truth to state the mineral ingredients of clean rice at 2 per cent, those of the whole crop, and to diminish therefore, the residuum of the cotyledon and epidermis by 0.06 per cent., making the per centage statement to stand thus:

Stubble and root,	36.08
Straw and leaves,	36.08
Husk,	14.20
Cotyledon and epidermis,	11.64
Clean rice, (commercial)	2.00
	100.00*

* It may be useful to present here, also, a *per centum* view of the incombustible constituents of the rough-rice.

Husk, - - -	51.00
Cotyledon and epidermis,	41.81
Clean rice, - - -	7.19

It scarcely need to be stated, that the cotyledon and epidermis are found in the coarse rice flour, intermingled largely with the husk, and with from 3 to 4 per cent. of powdered clean rice. The cotyledon and the epidermis are richer than the clean rice in saccharine matter and gluten, which materially augment the value of rice flour as a feed for cattle and swine. These principles are thus returned to the soil under the most favorable conditions for agriculture.

[9.] If the foregoing views are correct, it becomes plain, at a glance, that the planter who sells his crop in the condition of rough rice, robs his lands of 27.84 per cent. of the mineral ingredients of this species of produce; while on the other hand, he who sells it as clean rice, substracts from them but 2 per cent. of these ingredients.

But the true value of these constituents cannot be rightly estimated by their numerical proportions, since the mineral ingredients of the cotyledon and epidermis consist of above 50 per cent. of the most precious saline substances, while in those of the stubble, root and husk, the like constituents scarcely rise to 10 per ct.

[10.] From the extreme slowness with which the husk suffers conversion into humus, unless fermented with stable litter, this portion of the rice-plant appears to be almost wholly neglected by the planter. But as it contains above 30 per cent. of carbon, it must be capable, when incorporated with the soil, of performing to a considerable extent the functions of humus, *i. e.* of gradually giving rise to carbonic acid from combining with the oxygen of the air, and of raising the temperature of the soil by its eremacausis, or slow combustion. Besides, its minutely divided silica, is in a more favorable condition for absorption by the rootlets of plants, than that which is offered to them by the soil itself. We may add to these supposed useful properties of the husk, the mechanical service which in certain stiff, compact lands it is capable of exerting, by keeping the ground open to the access of air, and as an absorbent of moisture. As it is unlike to the stalk and leaf, in not containing alkali, it might perhaps be found advantageous to add wood-ashes along with it to the soils on which it is applied.

The extraordinary results, so fully proven of late, to flow from the use of minutely divided charcoal, would perhaps authorise another mode of treating the rice offal, which is to burn it with a smothered combustion in small kilns, or in heaps partly covered with soil, whereby it might be converted into a species of charcoal. I should anticipate from such a preparation of the husk, whether applied alone, or previously mixed up with putrescent matters into a compost, the most marked effects.*

I conclude this report with the hope, that this inquiry, which is by no means supposed to have exhausted the subject, or to have reached that rigid accuracy of result, which it is to be hoped may one day be obtained, may afford the rice planter more valid reasons than he before had, for husbanding those mineral elements of his crop with a religious care, the neglect of which, with whatever apparent impunity it may at first be attended, cannot fail in the end to involve him in a hopeless struggle against nature.

C. U. SHEPARD.

Charleston, April 6th, 1844.

* I need scarcely to add, that the different composition of the stem and leaves of the rice, would scarcely justify a similar procedure with these parts of the plant, since unless the temperature be regulated with great care, the silica would form with the associated alkali, a true glass, which for agricultural purposes, would be nearly as inoperative as common sand.

SAUSSURE'S EXPERIMENTS.

To the Editor of the N. E. Farmer:

DEAR SIR,—I send you the following in answer to the inquiry of "A Constant Reader," in your last. The experiments of Saussure to which he refers, are those, I suppose, performed to solve the following question, proposed by "Le Congres Scientifique de France":—"Is it possible that substances of ternary and quaternary composition, can be assimilated, after having been absorbed by the roots of plants?" Among such substances, *humus*, and other organic matters of fertile soils—that is, soluble geine, and geates—Saussure considers the most important, and it is to these that his observations refer. His remarks, &c. were originally published in the "Bibliotheque Universelle de Geneve," from which they were extracted by Liebig, who, appending certain strictures of his own, inserted the whole in his "*Annalen*," from which they have been copied into the London "Annals of Chymistry," the source to which I am indebted for them.

With regard, your friend and serv't

Lowell, March 30, 1844. SAM'L L. DANA.

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1. "*Absorption of Humate of Potassa by Beans.**

"The root of the plant was placed in a test tube of 22 millimetres (nearly nine-tenths of an inch) interior diameter, and 150 in height, (6 inches,) which contained a dark brown solution of carbonated humate of potassa, or seven centigrammes (1 grain) of dry humic salt, containing according to analysis, 18 milligrammes (nearly 3-10 of a grain) of humus. Besides the before mentioned plant, a similar vessel, filled with a solution of the humic salt, was placed, with a view to ascertain what change would be effected in it by evaporation and the influence of the atmosphere.

"After a fortnight, the original weight of the plants, 11 grammes, (170 grains,) had increased 6 grammes (92 grains.) It had absorbed 135 grammes (about 4½ oz.) of the liquid. The absorbed liquid was replaced every day by distilled water. The white roots of the plant had obtained their full length. No sediment had been deposited either on the plant or from the liquid. The latter had evidently lost in color nearly in the same proportion as if it had been diluted with twice its volume of water. These results are so striking and so easily obtained, that no doubt can exist in the mind of any one who will be at the pains to repeat the experiment.

"The liquid remaining behind, after the growth of the plant, yielded, on evaporation in a water-bath, 2 centigrammes (3-10 of a grain) of humate of potassa, containing 9 milligrammes (nearly 1-10

* "This humic salt was prepared by boiling, for several minutes, sifted mould, from Mendon, with half its weight of bicarbonate of potassa, using 40 times its weight of water. The solution was then diluted with a quantity of water sufficient to maintain the perfect nourishment of the plant."

of a grain) of humus—a quantity which may be about equivalent to that absorbed by the plant.

2. "*Absorption of the Humate of Potassa by the common Knot-grass, (Polyganum persicaria.)*

"I plunged the roots of a Polyganum persicaria, weighing 20 grammes, (nearly 310 grains,) into a solution of 430 cubic-centimetres (6622 grains: a pint imperial of distilled water is 8780 grains:) of humate of potassa. This plant, on account of its absorbent properties as a marsh plant, is much more suited for experiments of this kind, than a bean plant.

"These 430 cubic centimetres of solution contained 0.73 grammes (a gramme is 154 troy grains) of dry humate of potassa: the absorbed liquid was not replaced. In the course of ten days, the liquid had diminished to 65 cubic centimetres, (1003 grains.) Its color was darker than that of the original solution, in consequence of the healthy plants absorbing the water in greater proportion than the substances held dissolved in it.

"The plant had increased in weight 3½ grammes, (nearly 54 grains.) The dry saline humate which had been absorbed, must, according to the weight of the residue, have been 0.352 grammes, containing, according to analysis of the humic acid salt before and after absorption, as the composition is not invariable, 43 milligrammes (662 grs.) of humus.

3. "*Absorption of Extract of Mould by Polyganum persicaria.*

"I macerated for two days a certain quantity of heath mould from Mendon,* in half its weight of rain water. 100 grammes (1543 grains) of the filtered liquid yielded on evaporation in a water-bath, a dark brown neutral extract, which weighed, whilst warm, 0.338 of a gramme—not an invariable result, I would observe. This substance, as is also the case with the greater part of the extractive of mould, did not contain any perfect humus. The aqueous solution deposits, however, on evaporation, a precipitate which is a modification of humus. These extractive matters are, therefore, not to be considered as solutions of humus, but rather as substances capable of producing humus. These extracts, especially the latter, are plentifully imbued with azote.

"Twelve centigrammes (nearly two grains) of this extract, were then mixed with 100 grammes of water, (1543 grains,): one-half of

*"The fertile mould of which we speak does not effervesce with acids. Burnt, it leaves behind 0.22 of earthy matter and metallic oxides, combined with several salts. Moistened with a little water, in consequence of the partial solubility of organic matter, it enters into fermentation, if the air be excluded by a jar over a mercurial bath, and disengages carbonic and acetic acids, which, previous to fermentation, were not contained therein. The first infusion of this extract, contained (like most moulds) about one-fourth of deeply colored grape sugar, besides much destrin, a substance containing azote, with a deposite of extractive, some traces of nitrate potash, nitrate ammonia, muriate lime and muriate potash. It left 14½ per cent. of ashes, containing 3 per cent. of salts soluble in water, of which 1-10 was carbonate of potassa. It contained phosphate of lime and potash, and other alkaline salts. That portion of the ashes which was insoluble in water, contained chiefly phosphate of lime, metallic oxide, and silica."

the filtered solution was taken for the nutriment of two plants, *(Polyganum persicaria)*—the other was retained in a similar vessel, which did not, however, contain any plant. After the lapse of nine days, (during which time the absorbed fluid was replaced by water,) the plants, which seemed in a very healthy state, having grown 7 centimetres (nearly three inches) and sent forth long white roots, were taken out. The comparing fluid evaporated yielded a dry extract weighing 39 milligrammes, (.6006 grs.) whilst that of the liquid left by the plants, weighed only 33 milligrammes, (.5082 grs.)

"This experiment was remarkable, first, from the circumstance that the liquid containing the plants partially lost its color: secondly, from the perfect transparency of this solution compared with the change which the comparing liquid had sustained, this latter being altogether turbid: thirdly, for the quantity of water evaporated from the plants. This amounted, at a temperature of nearly 22° Centigrade, (=68° Fahrenheit,) sometimes to 3½ times the weight of the plant, in the space of 24 hours.

"In some of my experiments on the absorption of organic extracts, the roots suffered, became black, especially at their extremities. By replacing the absorbed liquid with water, the solutions did not lose their color, and the weight of the extractive dry residue was sometimes greater than that of the extract previous to absorption.

"It appears that these operations are exposed to two different influences; first, the absorption of the nourishing substance; and secondly, to the replacement of humas by organic matter yielded by the decomposition of the plants. In case the latter influence prevails, or even when both influences are equal, the quantity of substances consumed in the nutrition of the plants, could not be defined. This, I conceive, explains the discrepancy of the results obtained by M. Harteg.

"Having thus proved the absorption of humus by the roots, it remains for me to refer to the assimilation of the said humus after having entered the plants. One of the proofs of this assimilation is derived from the absence of that peculiar coloring matter of the humus in the interior of those plants which have absorbed a strongly colored solution of humate of potassa, as compared with the different effects of coloring matters, (such as ink, &c.,) which are not fited for the nutrition of plants. The latter leave behind them traces of their passage, while the former are changed and partly assimilated by plants. A bean plant of fifteen inches high, whose roots were plunged in a filtered decoction of Brazil-wood acidulated with a little alum, was not able to absorb one-fifth of its weight of this solution which dyed of a red color four-fifths of its stalk before it withered; whilst Knot-grass, *(Polyganum persicaria,)* grew very well in the same liquid, absorbed its coloring components, and showed no trace thereof in the stalk; but when, on the other hand, a similar plant was absorbed in dilute ink, it received a blueish color

from absorption, which at the same time caused it to wither. The coloring matter of Brazil-wood underwent a change during its partial assimilation by the knot-grass; whilst in the bean plant, for which it was unfit nutriment, no decomposition ensued."

Some Remarks on the preceding Experiments of De Saussure, on the Nourishment of Plants. *By* J. Liebig.

[In our last we gave the experiments of Saussure on the absorption and assimilation of humus by plants, kindly furnished us by Dr. Dana, who has further increased our indebtedness to him by transcribing for our columns the subjoined strictures of Prof. Liebig on the above named experiments.—*Editor of the N. E. Farmer.*]

By a summary of the results of De Saussure's experiments, we obtain the following facts:

A horse-bean, vegetating for a fortnight in a solution of humate of potassa, increases in weight by 6000 milligrammes (6 grammes)—92.6 grs. and has consumed for this increase in weight, as defined by direct experiment, 9 milligrammes of humus—(1-10 of a grain.)

In a second experiment, a specimen of Polyganum persicaria, (a marsh plant,) increased in a solution of humus during a space of time not defined, 3500 milligrammes, (nearly 54 grains,) for which it had consumed, according to the calculation, 43 milligrammes of humus, (.662 grs.)

In a third experiment, two specimens of Polyganum persicaria increased in nine days by 7 centimetres (nearly three inches,) and had beside this, shot forth roots, for which they consumed from the extract of mould, 5 milligrammes, (.077 of a grain.)

These experiments, therefore, prove, with the strictest accuracy, that, presuming the humus to be absorbed in this form, and in no other, its quantity—even under the most favorable conditions, (where the water, in which the plant vegetates, contains more humus than the plant is able to absorb with that water,) is very small, and that the plant in the first experiment, assimilated in 100 days 1-10 of a grain of humus.* According to the last experiment, two specimens of Polyganum persicaria consumed together in nine days, 5 milligrammes, (.077 of a grain.) One specimen, therefore, in 100 days, 1-30 of a grain.

It follows from this, that the quantity of extract of mould (by itself or combined with carbonate of potassa,) absorbed by a plant, when nourished therewith under the most favorable circumstances, is so small, and therefore so difficult to define, that it is not unfair to suppose the possibility of inaccuracy of observation; that is to say that the experiments which go to prove the absorption of humus by the roots, do not possess the requisite power of demonstration.

* This is doubtless a misprint, and should be 14 days, 1-10 of a grain, = in 100 days to 0.714 of a grain. S. L. D.

If now, besides this, it can be proved, with the greatest certainty, that a solution of humus experiences, by the influence of the air, continual change, a true decomposition, in consequence of which carbonic acid is formed from its component parts, *why*, it may be asked, in the new experiments of De Saussure, has this influence of the atmosphere, which he himself ascertained, not been taken into account, in order to explain the loss in weight of the carbon in his test liquors? Every one who is a little conversant with M. De Saussure's researches, will easily be able to answer this question.

Respecting the part attributed to ammonia in vegetation, it has been objected to me that many plants, namely, vegetables, taste of animal manure, when it has been applied to them in too great quantity, and that herbivorous animals do not eat the grass or hay of meadows manured with dung-water. The truth of these facts cannot be doubted, and it may be the same with those plants which grow on marshy meadows, and on a soil containing animal or vegetable matters in a state of putrefaction, to which the atmosphere has not free access.

All these observations entirely prove, then, that all such foreign matters take no part in the process of vegetation of the plant; for supposing this to be the case, all those odorous and vapid components of manure or dung-water, would not have preserved their peculiarity; for they would have lost it necessarily, if the plant had consumed them for its development.

A plant absorbs, like a sponge, all soluble components of the soil; but in colored fluids, in solutions of dying materials, the plant by absorbing them becomes sick and dies.

Now the earths of arable land and mould, in which plants vegetate most vigorously, do not contain any matters that can be extracted by rain-water, or which dye the water—(that is, no humus soluble in water)—for, as I have before observed on another occasion, we should easily discover them in the color of the springs of our meadows and of our forest brooks. And whence then is the humus derived which is required for the myriads of plants vegetating in the sea?

The water of our wells is in general colorless and transparent; in calcareous soil, it is rich in bicarbonate of lime, without humus. This carbonate acid derives its origin from vegetable matter: it is humus, which, without dissolving, yields this gas, by its own decomposition.

The springs in meadows and marshy places, impregnated with iron, contain it in the form of protoxide dissolved, instead of lime, in carbonic acid—a combination which forms only in the upper strata of mould. By deepening these springs, the water ascending from beneath is found free from iron, and their contents of carbonic acid are very much diminished. How is it possible, taking in account so many well-known facts, to entertain the least doubt as to

the true part which mouldering vegetable humus matters act in the nutrition of plants?

Certainly, most plants vegetate, in pure quartz irrigated with distilled water, only very scantily; while they are developed more vigorously in good and appropriate mould. But plants require, besides water and air, other conditions for the process of nutrition which the quartz does not yield to them, and without which they likewise vegetate scantily in mould, if these conditions be not present. All inferences which may be drawn from experiments of this kind, do not possess any validity in the present day.

Liebig's "Annalen."

☞Our limited knowledge in chemical science does not warrant us to attempt to decide in this case in which learned "doctors disagree;" but were we to offer an opinion merely, upon the subject in dispute, we should say, that if Liebig has not the *right side* in the question, he has at least fortified his positions with weighty arguments which it seems impossible to reconcile with the doctrine which the experiments of Saussure are claimed to have proved as the true one. Some further remarks of Saussure on the assimilation of humus by plants, with Liebig's reply, Dr. Dana has kindly promised to condense for our next paper. [It shall appear in our next Southern Agriculturist.]

[*Editor of the N. E. Farmer.*

From the [Columbia] South-Carolinian, of June, 6th.

OVERSEERS.

We seldom see communications in agricultural journals in reference to overseers. Yet overseers are most important characters in all planting operations, and it would be as much to the interest of planters to improve them, as to improve their lands, stock, or manner of planting. In fact more, for without improving them it is very difficult to effect any other improvement. Even with the best managers, most of the pleasure if not profit of planting, depends on the character of the overseer. Planters may be divided into two great classes, viz: those who attend to their business, and those who do not. And this creates corresponding classes of overseers. The planter who does not manage his own business must of course surrender every thing into the hands of his overseer. Such a planter usually rates the merits of the overseer exactly in proportion to the number of bags of cotton he makes, and of course the overseer cares for nothing but to make a large crop. To him it is of no consequence that the old hands are worked down, or the young ones overstrained; that the breeding women miscarry, and the sucklers lose their children; that the mules are broken down, the plantation tools destroyed, the stock neglected, and the lands ruined: So that

he has the requisite number of cotton bags, all is overlooked; he is re-employed at an advanced salary, and his reputation increased. Everybody knows that by such a course a crop may be increased by the most inferior overseer, in any given year, unless his predecessors have so entirely exhausted the resources of the plantation, that there is no part of the capital left which can be wrought up into current income. And this seldom happens, for such planters usually allow their overseers or other agents to purchase freely what is wanted, so that most losses are repaired—at their cost, to be sure; but they keep no accounts, and never think of expenses. The amount of their reasoning on the subject, is, *that a good crop has been made, and therefore they must be prospering*. And so they go on to their ruin. But they have previously ruined many who might have been fine overseers. Having once had the sole management of a plantation, and imbibed the idea that the only test of good planting is to make a large crop of cotton, an overseer becomes worthless. He will no longer obey orders; he will not stoop to details; he scorns all improvements, and *will not* adopt any other plan of planting, than simply to work lands, negroes and mules to the top of their bent, which necessarily proves fatal to every employer who will allow it.

It seems scarcely credible, that any man owning a plantation, will so abandon it and his people on it, entirely to a hireling, no matter what his confidence in him is. Yet there are numbers who do it habitually; and I have even known overseers to stipulate that their employers should not give any order, nor interfere in any way with their management of the plantation. There are also some proprietors of considerable property and pretension to being planters, who give their overseer a proportion of the crop for his wages; thus bribing him by the strongest inducements of self-interest, to overstrain and work down every thing committed to his charge. The number, however, of those planters who resign themselves and other property to the tender mercies of their overseers, is rapidly diminishing, partly by their being compelled to sell out, and partly by the impulse which the times have given to agricultural improvement. It is begining to be distinctly understood, that planting is a profession by which no one can thrive, who does not understand and diligently pursue it; that, in fact, it is a *science*, intimately connected with, and requiring for its full investigation and application, a knowledge of almost all other sciences. And I am happy to add, that no science has advanced more rapidly, within the last ten years, or seems more likely to advance hereafter. Long as agriculture has been practised, it is yet in its infancy, as regards its perfection; and no field opens a wider sphere for genius, or affords a higher promise of fame, than the study and practice of it on scientific principles.

But here again we encounter the difficulty of overseers. Few of that large and increasing class of planters who manage their

own business, can dispense with agents and sub-agents. It is impossible, on a plantation of any size, for the proprietor to attend to all the details, many of which are irksome and laborious, and he requires more intelligence to assist him, than slaves usually possess. To him, therefore, a good overseer is a blessing. But an overseer who would answer the views of such a planter is most difficult to find. The men engaged in that occupation who combine the most intelligence, industry, and character, are allured into the service of those who place all power in their hands, and are ultimately spoiled. He is (or rather *was*, for there is a manifest change going on) esteemed but a second-rate man among his fellows, who will condescend to take orders from his employer, and manage according to the system of another person. And until this idea is *wholly eradicated*, and the real intelligence of the country, and the true owners of its wealth, can control its agriculture in the minutest details, the advance of improvement must be seriously clogged. What could be done in war, if the orders of the General in Chief were not scrupulously obeyed, from the second in command, through every grade, to the soldier in the ranks? So it is in planting. The planter must understand his business, and he must have agents to carry out his views, from the pitching of his crop, to the weaning of a pig. I therefore set it down as the first requisite of a *good overseer*, to OBEY ORDERS: Not resistingly, sullenly, and with a protest; but cheerfully, promptly, and with a full comprehension of their spirit, and desire for their success. And overseer who does this much, is worth having, though he may possess more than an average share of the faults of his class. Let him, if he wishes, give his opinion freely, and his reasons for it; but the matter once decided, let abide firmly, and in good faith, by the old adage, "obey orders, if you break owners."

The next requisite of an overseer, is capacity to understand and execute orders in the proper manner. Without this, of course, his best intentions will not avail you.

The duties of an overseer acting under the orders of his employer, are, first, to attend to the proper management of the negroes; to see that the tasks allotted them, are such as they can perform with reasonable industry; and to take care that they do perform them, and do it properly. The employer should regulate the tasks himself, in the main, and examine the work; but there are a great many details to which he cannot look, and in which the overseer himself will require assistants among the laborers. The overseer should attend punctually to the sick, giving medicine in strict canformity to directions; and, in the absence of the employer and physician, should be capable of using judiciously simple remedies himself. He should cheer and encourage the sick. He should especially take care of the old, the young, and the complaining, for the treatment of whom his employer has of course a system suited to his general plantation operations. And lastly, in reference to the management of negroes, it is the duty of the overseer to enforce

discipline and subordination, and with as little and as mild punishment as possible. The overseer whose constant and only resort is to the lash, and who expects to remedy by that all the malpractices which he should by his foresight and attention have prevented, is a brute, and deserves the penitentiary.

The second leading duty of an overseer, is to carry the keys of the plantation, and to feel himself wholly responsible for every thing upon it. Few negroes, however well disposed, have firmness to resist temptation. It should be placed as little as possible in their way; and they should not be allowed, if it can be avoided, to turn a key. If they are honest, keep them so. If the overseer cannot see *every* mule fed,—as he should do if possible,—he should at least give out all the feed himself, and take measures to be assured that it is applied as directed. This is his especial duty, and one that few employers can ever assist him in; and an overseer who will rigidly perform it, may always save his wages for his employer. Numbers waste many times the amount of them, by sheer neglect in this particular.

The third essential duty of an overseer, is to take care of the stock and tools of the plantation. And here the employer has to rely mainly on him. Whether the work-animals and tools in use are in good condition, the employer can readily perceive; but when they get out of order, he can only give general directions for the most part, which it is the business of the overseer to carry out in detail. So with the cattle and hogs; the overseer is charged with having them fed, and counting them, and accounting for the missing.

If the negroes are well managed, the keys safely handled, and the stock and tools properly taken care of by an overseer, all in accordance with the views and orders of his employer, I pronounce him a good overseer, and should like to employ him, *though his crop should fail utterly*—that is, if he obeyed orders, in managing it.—Crops will fail, from bad seasons, bad management, and poor land. For none of these things is an overseer, acting in his proper sphere, at all responsible. God gives the seasons; the employer pitches his crop, plants it, and directs the manner of working it; furnishes the hands, mules, and utensils; and has bought poor land, or wilfully allows it to remain so. The overseer is not to blame, *if he has obeyed orders.* The planter who does not himself select the land for planting, and regulate the extent of it properly, according to his force; and who does not adapt his ploughs and hoes, and sytematize his working, according to his soil, is not fit for his business, and should give it up. I had almost said, the planter who does not rest or manure his land, so as to improve it, and carry on a scheme of experiments in planting, should do the same. But it has not come to that yet; though it soon will.

In doing this part, however, let the employer consult his overseer, and treat his opinions respectfully, if he does not adopt them. He will learn much from him; and much also will be learned sometimes,

by consulting his most intelligent negroes. They are often good planters; but he must decide, and do it fully, taking clearly on himself the responsibility, and exacting thorough obedience.

In general, overseers are violently opposed to everything that is new to them in agriculture. The reason is, they are for the most part wholly uninformed in the science of agriculture, and defficient of correct reasoning on the principles of vegetation, the character of soils and manures, and the influence of air, heat, and moisture. Their hints are often valuable; their arguments rarely; for where the conclusions of an ignorant planter are just, in three cases out of four his reasoning has been false. And how can it be otherwise, when to understand the simplest process in vegetation, requires a tolerable knowledge of Chemistry, Geology, and Botany? A *good* overseer will readily engage in every experiment which his employer proposes. If it fails, he has gained a lesson, for which he had nothing to pay. If it fails through his neglect, he deserves a discharge, at least.

It will be seen that I do not mention being a good planter as one of the requisites of a good overseer. If he could have all the requisites I have enumerated, and did not know cotton from corn, I should not object to him. Save me from an overseer who is what is called "*a good planter*," with his obstinacy and self-conceit. You have first to *unlearn* him all he knows, before you can teach him anything. Some knowledge of the art may be valuable, in the employer's absence; but an employer should never be absent longer than he can give orders for the management of the crop, from planting to laying by. As to the idea of planting *successfully*, and being at any considerable distance from one's plantation; or leaving it for any considerable time, that is an absurdity of which all who have tried it are, I imagine, thoroughly convinced.

In conclusion, let me recommend the only two measures I think practicable, in conducting to the improvement of overseers. Let all those *pseudo* planters who neither understand nor attend to their business, abandon it, and allow the *real* planters the opportunity of selecting from the overseers of the country. It will be to the advantage of all concerned. Then let the *real* planters exact implicit obedience to orders; take their own responsibilities on their own shoulders; and require of their overseers the performance of their proper duties—those duties only, but those thoroughly.

I fear I have exhausted the patience of your readers with this long, rambling article. But I have not exhausted the subject. It is one of deep interest, and demands the attention of all engaged in agriculture. With your leave I may recur to it again.

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FATTING STEERS.

To the Editor of the American Agriculturist:—

At your request I send the following account of the five steers kept over winter. I bought them in October last, at $22 50 per head, pastured them a short time, and took them up 2d November, keeping them in the barn in stalls all winter, excepting a short time morning and afternoon, when they were turned into the yard to water and have their beds made. From 2d November to 2d December, they were fed twice a day, each time on a bundle of cut corn-blades, ½ bushel beets (mangol-wurtzel or sugar-beet,) and ¼ bushel corn and cob-meal ground together; this mess mixed up and divided among the five. In the place of hay, I gave them each a bundle of corn-blandes, cut in half with a broad-axe, and fed morning and evening. They had access to salt from a box in the barn-yard, besides some little mixed in their feed. From 2d December to 23d January, I gave them ½ bushel meal, 2 bundles of cut-blades, and 1 bushel beets, mixed and fed twice a day as before. This mess was put on at night in a large boiler and cooked, taken out and fed in the morning, when a similar mess was put on for the evening feed. Corn-blades cut with a broad-axe and fed as before as a substitute for hay. After the cattle had eaten off the leaves from the stalks they were passed through the cutting-machine (Briggs' patent) and thrown into the barn-yard. The cattle were carded every morning.

From 23d January to 4th March, (on which day I sold them at $33 per head,) they were fed three times per day; feed cooked each time, and consisted of ¾ bushel of meal, 2 bundles corn-blades, 1 bushel beets, and the intervening time, with about 8 lbs. per day of coarse clover hay each. I should have done better with the steers, had not one of them been quite sick the early part of the winter, injuring the sale of the others. The meal given these cattle would have sold for about $36, the hay for about $8, making $44; which gives expense per head about $9. This does not include the beets. My stock of cattle this winter has been 10 head, (one a calf,) and I have now in the yard about 170 large loads of good manure; for all my corn blades are cut fine before going into the barn-yard. From the fall of '42, to November '43, I made about 300 loads of manure. I advocate every farmer making his own manure. The cattle were soiled all summer. This statement I believe correct, as I have kept a regular account of the feed, and if my experiment be of any benefit to the farming community I shall be glade. JNO. M. C. VALK.

Carolina Hall, Flushing, L. I., March 7th, 1844.

REPORT ON INDIAN CORN.

To the Editor of the Southern Agriculturist:—

Dear Sir,—At a meeting of the Agricultural Society of South-Carolina, on Tuesday, the 18th inst., the accompanying report was read and accepted, and by resolution directed to be handed to the Editor of the Southern Agriculturist for publication.

Very respectfully yours,

JOS. F. O'HEAR,

Recording Secretary.

Charleston, June 19th, 1844.

—

Your Committee on Indian Corn, beg leave to report:—We consider the corn crop as second to no other crop made in the United States; and in this State, the advantage of raising our own supplies would be of great importance, and would save to the State a large sum of money spent annually for corn. Under these circumstances, any improvements in planting, or cultivating this valuable grain, must be interesting. By a judicious use of the plough, and other good management, the crop may be much increased, and in a few years, a full supply for the State might be expected.

In the years 1838 and '39, about 500,000 bushels of corn was imported. From October 1841, to October, 1842, 360,000; and from October, 1842, to October, 1843, 260,000; shewing an increase of the crop of the State, of 100,000 bushels in one year. This increase may be attributed to the efforts made by Mr. Ruffin and others, in recommending marl and other manures, and the proper use of ploughs.

All plants derive their nourishment from air, water and soil, and the corn plant must have a supply of air and moisture to effect a full development of its growth; and the soil, to do its part, must be well manured, and cultivated.

Where the land has been long planted, there is frequently a hard subsoil crust, which must be well broken up by the subsoil-plough, to enable the perpendicular roots to penetrate deep into the earth, to obtain moisture for the plant.

In preparing land for a corn crop, we would recommend that in the early part of the winter, a furrow of six or eight inches deep should be made with the common plough, that the subsoil-plough should be run in this furrow to the additional depth of ten or twelve inches, and that corn-stalks and other manure should be put in this trench, and listed in, when thoroughly wet, with a small plough or hoe, as may be convenient; the land to remain in this state, to the period of planting.

We cannot too highly recommend the use of the subsoil-plough. By its use the soil will be less wet after great rains, and more moist in great drouth. Mr. Delaplain informs us, that in 1823 he planted a field of 25 acres of corn; that in a part of this field he used the subsoil-plough, and in the other part, the common tillage. A furrow was made with the common bar share-plough, five or six inches deep, and with the subsoil-plough seven inches deeper—that in all other respects, the soil, planting and tillage was the same. In that part of the field where the subsoiler was used, the corn kept its colour throughout the season, and produced 50 per centum more than the other. And where the common tillage was used, it suffered much from drouth, and fired considerably.

Mr. C. M. Bement also states that he subsoiled a part of a piece of ground which he planted to Indian corn. The piece of ground was on a light loamy, or sandy knoll. That he subsoiled it in strips, leaving alternate strips not subsoiled, all being manured alike: He ran the subsoiler from eight to ten inches deep. The season proved to be very dry, and where the subsoil-plough was not used, the corn was so burnt up that it produced nothing; but where it was used, the corn remained green and flourishing through all the drouth, and produced a good crop.

By the use of the subsoil-plough in England, the crop of corn has been increased to an incredible degree, frequently doubled, and in many instances, trebled.

The best time for planting corn is about the middle of March. The soil must be moist at the time of planting, or a good stand cannot be expected. The seed corn ought to have been selected with care in the field from those stalks bearing the greatest number of ears. And here we would recommend in the highest terms the use of the coal-tar, to preserve the seed from birds, &c. When the seed is well prepared by the use of coal-tar and soot, and the soil well moistened by a good rain, to be planted at the distance of three feet, the rows being from five to six feet apart; and either one, or two stalks should be left, according to the fertility of the soil. Where the soil is very rich, or highly manured, we think it best to plant at two feet apart, and to leave two stalks.

As soon as the corn is up, the plough ought to be used in breaking up and pulverizing the earth between the rows, and when five or six inches high, the best ploughman ought to run a furrow as near as possible to the plant, the bar side of the plough being next to it, and the other ploughmen may break up the intermediate space between the rows. At this period the ploughing ought to be deep and close, breaking up, and pulverizing well the soil. By porosity of soil, the air is admitted, and a larger quantity of organic and inorganic food for the plant, is afforded.

In dry weather the oftener the plough is used the better, until the corn is about one-third grown, after which, the plough ought to be laid aside, and the cultivator or hoe-harrow used in its place. In

wet weather the plough ought never to be used. Corn is benefitted at all periods of its growth, by the application of manure on the surface, over the roots. If the drouth is great, and the corn far advanced towards maturity, the surface crust must be broken, and the earth frequently stirred lightly to admit air and moisture to the roots, but care must be had, not to disturb or cut the lateral, or surface roots.

About the time corn is maturing, brace roots shoot out from the joints near the surface of the earth. These roots frequently strike deep into the earth, affording both nourishment and support to the plant. If a high hill has been made, these roots shoot out higher upon the stalk where it is brittle, and likely to be snapped off the first high wind. If there be little or no hilling, the corn would bend and yield to the storm, and rise again, having sustained little, or no injury. This would be particularly the case, where the soil is very fertile, and highly cultivated.

Well grown corn has from forty to sixty large roots extending from the joints under the ground, which, with the tap-root, penetrate deep into the soil, if not obstructed by a hard subsoil. From these large roots, innumerable small fibrous roots shoot out in all directions towards the surface, extending across the rows five or six feet, in search of nourishment for the plant. The large perpendicular roots afford moisture, and the small fibrous roots, food to the plant. The deeper the perpendicular roots penetrate the soil, the less injury the plant will sustain from drouth. And the more the surface has been broken up and pulverized, the further the surface roots will extend in search of nourishment, to mature fine and large ears. We would here recommend, that the corn should not be turned down too soon, by which error, the quality of the corn is frequently much injured.

JOHN H. TUCKER, *Chairman.*

June 18*th*, 1844.

CORN-COBS.

The most economical method of disposing of corn-cobs, is doubtless to pound them up and grind them with corn, for stock. But as this is often neglected, another excellent mode of disposal is to soak them in pickle and feed them to cows or other cattle in the yard. A large tub, formed by sawing a hogshead in two, near the middle, should be placed in a convenient place, near the yard, and being filled with cobs, a sufficiency of warm water, strongly impregnated with common salt, should be poured over them to render them soft and palatable to the stock.

Most animals devour them greedily in this state, but when it is not too much trouble, grinding into meal is much preferable. There is but little difference in the value of pure corn-meal, and that made of corn and cobs, for feeding most animals. The meal of the cob also makes excellent puddings. [*Maine Cultivator.*

STATISTICS OF FRUIT.

As there seems to be at this time a general awakening on the subject of fruits, their culture, &c., all statistics on that subject will probably have an interest for your readers, and I therefore append the following calculation of the value of fruit, *per individual*, raised in each state. The data upon which this is based, is Mr. Ellworth's report of population and production for 1840. Leaving out fractions, the calculation stands thus:—

	Per person.		Per person.
New-Jersey,	$1 24	Rhode Island,	$0 26
Connecticut,	96	Missouri,	24
New-Hampshire,	84	Georgia,	23
Vermont,	73	Maryland,	22
New-York,	70	Indiana,	16
Virginia,	57	Arkansas,	12
Kentucky,	56	S. Carolina,	09
Massachusetts,	53	Alabama,	09
North-Carolina,	51	Michigan,	08
Tennessee,	44	Dist. Columbia,	08
Pennsylvania,	36	Mississippi,	04
Delaware,	36	Louisiana,	03
Ohio,	31	Florida,	02
Maine,	29	Wisconsin and Iowa, each one-tenth of 1 ct.	
Illinois,	27		

Average in all the states, 45 cents each person.

It might be a curious subject for investigation, for some one fond of such inquiries, to see if some connexions could not be traced between the quantity of fruit raised in each state, and its general healthfulness. That good fruit is a great promoter of health there is now no question; the respected opinions of our grand-parents to the contrary notwithstanding. It would seem, from present indications, the day is not far distant when we shall have a much more bountiful supply of fine fruits than at present, and as a consequence, *purer blood* and less *feverish brains!*

In evidence of this increasing interest, on inquiring the other day at one of your large agricultural ware-houses for a tree-scraper, I was informed that an instrument for the purpose was formerly made at the eastward, but its manufacture had been discontinued, for the best of all reasons, the want of demand; but that there had been more inquiries for the article within the last year, than in all the ten years previously. A ship-scraper, with one of the points rounded on the grindstone, so as the better to get into the crotches of the tree, answers every purpose.

S. C. HIGGINSON.

Newburgh, April 2d, 1844.

THE SEASON FOR TRIMMING TREES.

As soon as planting is over, we should look to our apple trees and cut off the surplus branches. We cannot recommend cutting large branches in any case; we usually do more hurt than good when we take off a limb that is more than two inches in diameter, for the wound will not often heal soon enough to prevent decay at the heart. A tree will sometimes look more thirftily, for a time, in consequence of lopping large branches, but the improvement will not be lasting. If trees are attended to annually, there will be no need of cutting large limbs. If they have been long neglected, we should content ourselves with trimming out the small limbs and suffer the tree to continue in the shape that it has already formed.

We may not be able to give any satisfactory reason for preferring May to March, for trimming apple trees. Most farmers however, agree that the sooner the wound is healed, the better, and that it is not of service to draw forth much sap at the wound. Now it is certain that a wound never begins to heal till the tree has put forth its leaf. It has no means of making new wood before it has leaves, for the sap that forms the new wood passes through the leaf. From the time of trimming, then, to the forming of the leaf, your wound is exposed to the weather, and the process of healing has not commenced.

We find that when a limb is cut in July, there will be about as much new wood made to cover the wound, during the season, as when the limb is cut earlier. There is a critical time, however, in July, between the first and second growth of the season, when the sap will run from a wound, and will discolor the bark for a foot or more below it; we notice this in trimming nursery trees, and we think trimming in July is not judicious.

As to the comparative waste of sap in March and May, we call the attention of our readers to the practice of tapping the maple for the purpose of gathering sap. All know that no sap can be gathered in May, and not much in April, in our latitude. Sap runs most freely in March. For this reason, we never trim grape vines in March. But after the leaf is formed, the vines will not bleed.

You want a fine saw to trim with, to make as smooth a wound as may be, and if a knife is used after the saw, the wound will heal the sooner. Yet we often see trees trimmed with an axe! We also see the bark torn off of the limbs by the use of heavy boots of the trimmer. All will own this is barbarous. If you stand on the tree while trimming, you should wear slippers or thin shoes.

When no limbs larger than one inch in diameter are cut, the wound may be expected to heal over in a couple of years; in a thirfty tree it will heal in one year. When only small limbs are cut, there will be no need of covering the wound with clay, or with any kind of plaster. We cannot find that limbs which have been grafted and then covered over with any kind of compost, heal faster than limbs

uncovered. A limb should always be cut in such a manner, as to let no rain-water stand in the little cup that will be formed by the healing of the wound. [*Mass. Ploughman.*

EVERY MAN HIS OWN CATTLE DOCTOR.

By Francis Clates, Editor, revised by William Youatt, author of the Horse, with additions, by John S. Skinner, Esq., Assistant Post-Master-General. Price 50 *cents.*

We acknowledged the recepion of a copy of the above work, on the cover of our last Number, and was promised a review of it—but circumstances have prevented our friend from furnishing it, we therefore say in the words of another, that

"It is one of the most valuable that has appeared—and should be in the hands of every farmer. The English work is of itself, a most excellent one, and the directions for the treatment of the various diseases, to which animals are subject, are so full, as in a great measure to render a resort to a farrier unnecessary.

The additions, by Mr. Skinner, on the use of oxen, and the improvement of sheep, we consider to add very much indeed to the work. The essay on the use of oxen, is most ably written, and we rose from its perusal, convicted that for farm purposes, the ox is far more valuable than the horse, and that the introduction of working cattle among our farmers, would be a matter of economy, in every respect, and that so far as the farm is concerned, the work would be as expeditiously performed.

That improvements are needed in our sheep, no one can doubt. The remarks of Mr. S. on this subject, are such as must commend themselves to every reader. We would bespeak for this work, an extensive circulation. The low price at which it is published, containing as it does, 251 pages, places it within the means of every farmer. The Agriculturists of America, are much indebted to Mr. Skinner for this work, as they have often been before, for valuable articles from his pen. [*Central N. Y. Farmer*

NEW METHOD OF OBTAINING CREAM FROM MILK.

Extracted from Hon. Henry L. Ellsworth's Report.

The process of divesting the milk of its component portion of cream, to an extent hitherto unattainable, has been effected by Mr. Carter, of Nottingham lodge, near Eltham, Kent, and is thus detailed by that gentleman in a paper presented to the Society of Arts:

A peculiar process of extracting cream from milk, by which a superior richness is produced in the cream, has long been known and practised in Devonshire; this produce of the dairies of that country being well known to every one by the name of "clotted,"

or "clouted" cream. As there is no peculiarity in the milk from which this fluid is extracted, it has been frequently a matter of surprise that the process has not been adopted in other parts of the country. A four-sided vessel is formed of zinc plates, twelve inches long, eight inches wide, and six inches deep, with a false bottom at one-half the depth. The only communication with the lower apartment is by the lip, through which it may be filled or emptied. Having first placed at the bottom of the apartment a plate of perforated zinc, the area of which is equal to that of the false bottom, a gallon (or any given quantity) of milk is poured (immediately when drawn from the cow) into it, and must remain there at rest for twelve hours. An equal quantity of boiling water must then be poured into the lower apartment, through the lip. It is then permitted to stand twelve hours more (i. e. twenty-four hours altogether;) when the cream will be found perfect, and of such consistence that the whole may be lifted off by the thumb and finger. It is, however, more effectually removed by gently raising the plate of perforated zinc from the bottom, by the ringed handles, without remixing any part of it with the milk below. With this apparatus, I instituted a series of experiments, and, as a means of twelve successive ones, I obtained the following results :

Four gallons of milk, treated as above, produced, in twenty-four hours, 4½ pints of clotted cream ; which, after churning only fifteen minutes, gave 40 ounces of butter. The increase in the cream, therefore, is 12½ per cent., and of butter upwards of 11 per cent.

The experimental farmer will instantly perceive the advantage accruing from its adoption, and probably his attention to the subject may produce greater results.

AGRICULTURAL PRODUCTS OF THE U. S.

From Annual Report of the Commissioner of Patents, (the Hon. Henry L. Ellsworth,) Mr. E. estimates the agricultural products of the U. S. for 1843, as follows :

Wheat,	bushels,	100,310,846
Corn,	"	494,618,305
Oats,	"	145,929,966
Rye,	"	24,280,271
Barley,	"	2,220,721
Buckwh't,	"	2,959,410
Potatoes,	"	105,756,133
Hay,	tons,	15,419,807
Tobacco,	lbs.	185,731,554
Cotton,	"	747,660,090
Rice,	"	89,879,145
Silk,	"	315,965
Sugar,	"	66,400,310
Wine,	gallons,	139,240

Estimated present population U. S. 19,183,583. There were granted during 1843, no less than 531 patents, while 446 expired during the same period. There were 819 applications. The whole number of patents issued by the Goverment is 13,523. The receipts of the Patent Office during 1843, were $35,315; expenditures $24,850; returned to claimants whose claims to patents were denied, $5,026. For restoring the models, &c., destroyed by the burning of the Patent Office, $4,538.

CHEAP GIN-BAND.

A planter residing in the parish of Tensas, informs us that during the present ginning season, he has dispensed with the use of leather for gin-bands, substituting in its stead a band made of stout Lowell cotton. The strips are cut to the proper length and doubled four times, and require splicing but at one place, and are sewed with strong thread. It is superior to leather from the fact that it runs more slack and is materially lighter, and can be used at least two seasons; the saving in cost alone is sufficient to induce any one to try the experiment. We are assured of its success by the gentleman to whom we are indebted for the information.

[*Louisiana paper.*

POULTRY.

It is scarcely credible how valuable is the poultry in the United States. By the census of 1840, it was returned at $12,176,170. New-York contributes $2,373,029, which is more than the value of all its swine, half the value of its sheep, the entire value of its neat cattle, and five times more than the value of all the horses and mules in the State. These facts are derived from a publication of Harper's, called the American Poultry Book.

ONIONS.

In compliance with your polite request, I send you my method of raising onions. Ground rich from the hen house—ground hard except half an inch on top—harder the better. My onion bed has not been ploughed for three years past, and I do not want it ploughed for that crop for 10 years to come. I lighten the ground to the depth of half an inch with a hoe and rake, and sow when the ground is sufficiently moist to promote the immediate growth of the seed.